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IS 4927 (1992): Specification for Unlined Flax Canvas Hose for Fire Fighting [CED 22: Fire Fighting]



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अग्नि शामकों के लिए अस्तर रहित सन

कैनवास हौज — विशिष्ट

(पहला पुनरीक्षण)

Indian Standard

UNLINED FLAX CANVAS HOSE FOR FIRE
FIGHTING — SPECIFICATION

(*First Revision*)

UDC 621.643.3 : 614 : 843.2 [677.11]

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

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Price Group 2

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Fire Fighting Sectional Committee had been approved by the Civil Engineering Division Council.

Unlined flax canvas hose is used by the Fire Services in circumstances where some degree of percolation is essential to prevent the hose from being scorched when used over hot surfaces and also where water damage because of percolation is not of any consequence.

This standard had been first published in 1968 to guide the users in purchasing fire fighting hose of a dependable quality and to assist the manufacturers in producing it. The present revision of the standard is being taken with a view to making modifications in light of experience gained during the use of this standard. The major changes include deletion of the requirement relating to frictionloss, change in the recommendation for testing flexibility, inclusion of a minimum specified percolation value, and change in the rate of application of pressure in case of Hydrostatic proof pressure and burst pressure test.

Only the performance characteristics of unlined flax canvas hose have been dealt with in this standard. This is with a view to allowing scope of development in the manufacturing processes. It may be noted that to ensure an all-round quality of this type of hose, a balance has to be struck between various conflicting requirements. This has been a guiding factor in the preparation of this standard.

Reference to the warp and weft contents of the hose has not been included as these are dependent on other requirements, like weight of the finished product, flexibility, bursting pressure, etc, and will be automatically controlled if other requirements are complied with.

In the formulation of this standard due weightage has been given to international co-ordination among the standards and practices prevailing in different countries in addition to relating it to the practices in the field in this country.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (revised)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

UNLINED FLAX CANVAS HOSE FOR FIRE FIGHTING — SPECIFICATION

(First Revision)

1 SCOPE

1.1 This standard lays down the requirements of material used in the manufacture and performance criteria of unlined flax canvas hose.

2 REFERENCES

2.1 The following Indian Standard is a necessary adjunct to this standard:

<i>IS No.</i>	<i>Title</i>
443 : 1975	Methods of sampling and test for rubber hoses (<i>second revision</i>)

3 MATERIAL

3.1 The hose shall be manufactured from flax yarn, having an alkali solubility of not more than 10 percent as determined in accordance with the procedure detailed in Annex A.

4 SIZES AND TOLERANCES

4.1 Sizes

The hose shall be supplied in three sizes, the nominal internal diameter of which shall be 38, 50, 63 and 70 mm.

4.2 Tolerances on Internal Diameter

The finished internal diameter of the hose shall be not less than the nominal specified diameter and shall not be greater than the nominal diameter by more than 2 mm.

5 LENGTHS

5.1 Unless otherwise specified, the hose shall be supplied in the lengths of 30 m which are normally used by the Fire Services.

6 MASS

6.1 The mass of the finished product per

metre length of hose, shall be as follows:

<i>Nominal Diameter</i>	<i>Maximum Mass per Metre Length</i>
mm	g
38	250
50	300
63	400
70	470

7 FLEXIBILITY

7.1 Coil Diameter (Machined Coil)

For the 30 m length of dry hose without coupling, the coil diameter shall not exceed 45 cm.

8 PERCOLATION

8.1 The percolation, when tested in accordance with the procedure laid down in Annex B, shall not exceed the limits prescribed in Table 1.

9 CHANGE IN SIZE

9.1 Change in Length

The increase in length shall not exceed 6 percent when tested in accordance with 9.1.1.

9.1.1 Connect the hose to a suitable pump and raise the pressure to 70 kPa (0.7 kgf/cm²) ensuring that all the entrapped air has been forced out. Mark the two points not less than 1 m apart. Now raise the pressure to 1 MPa (10.2 kgf/cm²) and maintain for minimum 2 minutes and measure the distance between the two markings again. Also measure the diameter at both the pressures.

9.2 Change in Diameter

Change in diameter when tested in accordance with 9.1.1 shall not be more than 6 percent.

Table 1 Percolation Requirements
(Clause 8.1)

Nominal Dia	Percolation During 6th to 10th Minute Period (Inclusive) After Researching Maximum Pressure	
	Minimum	Maximum
(1)	(2)	(3)
mm	litres	litres
50	0.7	11
63.0	1.0	12.5
70.0	1.5	13.5

10 HYDROSTATIC PROOF PRESSURE

10.1 Full length of hose shall be subjected to an internal hydraulic pressure of 2.1 MPa (21 kgf/cm²) and shall be in accordance with 8.3 of IS 443 : 1975. Increase the pressure at the rate of not exceeding 1 MPa (10.2 kgf/cm²) per minute and maintained for a period of 1 minute. During this test, the hose shall not show any leakage or breakage of yarn.

11 HYDROSTATIC BURST PRESSURE TEST

11.1 A test length of hose, 1 m clear of fittings when subjected to an internal hydraulic pressure in accordance with 8.2 of IS 443 : 1975, increasing it at the rate not exceeding 1 MPa (10.2 kgf/cm²) per minute shall not burst

before a pressure of 3.5 MPa (35.7 kgf/cm²) is reached.

12 SAMPLING AND CRITERIA FOR CONFORMITY

12.1 For the purpose of ascertaining the conformity to this standard the scale of sampling and the criteria for conformity shall be as laid down in Annex C.

13 MARKING

13.1 The hoses shall be marked as follows at every 15 m, beginning at each end. The marking shall begin after leaving 30 cm from each end of hose:

- Manufacturer's name or trade-mark;
- The words 'UNLINED FLAX CANVAS HOSE' — 38 mm, 50 mm, 63 mm or 70 mm;
- Month and year of manufacture; and
- Length of hose in metres.

14 PACKING

14.1 Each length of hose shall be rolled tightly in neat and clean roll and shall be packed individually in damp-proof and waterprof packaging material.

ANNEX A

(Clause 3.1)

DETERMINATION OF ALKALI SOLUBILITY OF FLAX

A-1 GENERAL

A-1.1 The alkali solubility is a measure of the amount of non-cellulosic constituents (readily available as foodstuffs for micro-organism) which is left commercially boil flax materials. It is determined by giving the material a further boil in a relatively strong solution of sodium carbonate. The percentage loss in weight in the carbonate boil minus that which occurs on boiling in water alone, is the alkali solubility of the materials.

A-2 APPARATUS

A-2.1 Weighing Bottles

A-2.2 Conical Flasks

500 ml in capacity with reflux condenser.

A-2.3 Large Buchner Funnel

A-2.4 Filter Paper

A-2.5 Oven

A-2.6 Chemical Balance

A-3 REAGENTS

A-3.1 The following are the reagents required:

- Sodium carbonate A.R. (5 percent solution, wt/vol); and
- Distilled water.

A-4 PROCEDURE

A-4.1 About 10 g of the yarn shall be separated into three approximately equal portions

and conditioned together for at least two hours and then separately weighed in dry, stoppered weighing bottles. A 5 percent solution of sodium carbonate (250 ml) shall be brought to boil in a 500 ml conical flask fitted with a reflux condenser. One sample of the yarn shall be added to the boiling soda solution and gently boiled for two and a half hours. The sodium carbonate shall be of 'analytical reagent' purity. The liquid shall then be poured from the yarn and replaced by 200 ml of hot distilled water (above 70°C), the liquid being then filtered through a hardened filter paper on a Buchner funnel of about 15 mm in diameter. The yarn shall be washed four times by decantation with 200 ml of distilled water at about 70°C, the washing being passed through the filter. The yarn shall then be transferred to the filter, washed three times

with 200 ml of hot distilled and dried in a water oven at about 90°C for one hour. The yarn, along with any fragments of fibre detachable from the filter paper, shall now be transferred to the weighing bottle and dried to constant weight at 105°C. The weight shall be recorded. The third sample shall be added to 250 ml of boiling distilled water and gently boiled for two and half hours. The subsequent treatment of washing and filtering and weighing shall be as prescribed for sample number one.

A-5 EXPRESSION OF RESULTS

A-5.1 The percentage losses in weight referred to the oven dry weight produced by the carbonate boil and by the distilled water boil shall be calculated. The difference between these two losses shall be termed the alkali solubility.

ANNEX B

(*Clause 8.1*)

PERCOLATION TEST

B-1 PROCEDURE

B-1.1 A 3.5 m portion of a length of hose shall be subjected to the test. The test length may be obtained by isolating in a trough 3.5 m portion of a longer length, water under pressure shall be passed through the test length in such a manner that the pressure is built up steadily over a period of two minutes to a

value of 7 kg/cm² (70 N/cm²), which shall then be maintained throughout the period of the test by regulating water discharge at the other end with the help of suitable coupling with stop cock or pet cock. Measurement of leakage shall be made at the beginning of sixth minute until the end of the tenth minute. The test shall be conducted in normal humidity conditions.

ANNEX C

(Clause 12.1)

SAMPLING AND CRITERIA FOR CONFORMITY

C-1 SCALE OF SAMPLING

C-1.1 Lot

In any consignment, all the lengths of hoses of the same size and length produced under essentially similar conditions of manufacture shall be separated into groups of 100 lengths or less and each such group shall constitute a lot.

C-1.2 Tests for the determination of the conformity of a lot to the requirements of the standard shall be carried out for each lot separately. The number of lengths of hoses to be selected for this purpose shall be in accordance with col 1 and 2 of Table 2.

C-1.3 The required number of lengths of hoses shall be selected at random from among the lengths in the lot. For this purpose, suitable random number tables shall be used. In case such tables are not available, the procedure as given in C-1.3.1 for selection may be adopted.

C-1.3.1 Starting from any hose in the lot, count them as 1, 2, 3....., up to r and so on in one order, where r is the integral part of N/n (N being the lot size and n being the sample size). Every r th hose thus counted shall be withdrawn to give sample for inspection and testing.

C-2 NUMBER OF TESTS AND CRITERIA FOR CONFORMITY

C-2.1 The lengths of hoses selected according to C-1.2 and C-1.3 shall be inspected visually for weaving defects, dirt, knots, lumps, etc, and subjected to dimensional measurements such as diameter and length of hose. These lengths shall also be examined for weight per metre length and flexibility. Any length found to be unsatisfactory with regard to one or more of these characteristics shall be considered as a defective length.

C-2.1.1 If the number of defective lengths found is not greater than the corresponding number of defectives given in col 3 of Table 2, the lot shall be declared as conforming to the requirements of these characteristics. Only such lots shall be further examined for the other tests.

C-2.2 From each of such lots which are found to be satisfactory according to C-2.1.1 one length of hose shall be chosen at random to provide test pieces for the determination of various specification requirements (such as percolation, proof test, bursting pressure and alkali solubility of flax) which involve cutting up of the hoses. The test pieces required for all these determinations may be cut from either end of the chosen length of the hose.

C-2.2.1 The lot shall be declared as conforming to the requirements of these characteristics if the test results for the determination of different characteristics are all found satisfactory. In case the test result for any characteristic fails to meet the relevant requirement of the specification two more tests shall be conducted for that characteristic on two other different lengths of hoses chosen from the lot and only on finding these two satisfactory, the lot shall be considered as conforming to the requirements of that characteristic, otherwise not.

Table 2 Scale of Sampling

(Clause C-1.2 and C-2.1.1)

Lot Size (In Length)	Sample Size (In Length)	Permissible Number of Defective Lengths
(1)	(2)	(3)
Up to 15	All	0
16 to 25	15	0
26 to 50	20	0
51 to 100	32	1

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AMENDMENT NO. 1 FEBRUARY 1994
TO
IS 4927 : 1992 UNLINED FLAX CANVAS HOSE FOR
FIRE FIGHTING — SPECIFICATION

(First Revision)

(Page 1, clause 4.1, line 1) — Read the word 'four' in place of 'three'.

(Page 2, Table 1, Title of col 2 and 3) — Read 'Reaching' for 'Researching'.

(Page 3, clause A-4.1, line 22) — Add the word 'water' after the word 'distilled'.

(Page 3, line 23) — Read '98°C' for '90°C'.

(Page 3, clause A-4.1, line 27) — Add the following after the word 'recorded':

'The second sample shall be used to determine the moisture content by drying to constant weight at 105°C. The weight shall be recorded.'

AMENDMENT NO. 2 FEBRUARY 2001
TO
IS 4927 : 1992 UNLINED FLAX CANVAS HOSE FOR
FIRE FIGHTING — SPECIFICATION

(Page 1, clause 4.1, line 1) — Substitute 'four' for 'three'.

(Page 1, clause 5.1, line 2) — Substitute ' 30 ± 2 m' for '30 m'.

(Page 2, Table 1, Heading):

a) Substitute 'Reaching' for 'Researching'.

b) Insert percolation value for 38 mm under columns:

(1)	(2)	(3)
38	0.5	5.0

(Page 2, clause 10.1) — Delete 'leakage or' from last line.

Add new sub-clauses after clause 10.1:

'10.2 The sample shall be thoroughly wetted out before testing, for not less than 15 minutes at pressure of 0.7 MPa (7 kgf/cm^2).

10.3 The pressure is raised up to 1.2 MPa (12 kgf/cm^2) at a uniform rate within half a minute and retained for one minute. Pinholes (without breakages of yarn) shown up at this test pressure and which are easily repairable by darning shall not be regarded as serious defects.

10.4 Weft thread breakages shall be regarded generally as serious defects, but the breakage of a weft thread in the selected length may be regarded as repairable if so agreed between the purchaser and the manufacturer.'

(Page 2, clause 11) — Insert new subclause 11.2:

'11.2 The test length shall be thoroughly wetted out before testing for not less than 15 minutes at a pressure of 0.7 MPa (7 kgf/cm^2).'

(Page 2, clause A-4.1):

a) In line 22 add 'water' after 'distilled' and delete 'water' after 'dried'.

b) Substitute ' 98°C ' for ' 90°C ' in line 23 of A-4.1.

c) Substitute 'second' for 'third' sample in line 28 of the A-4.1.

(CED 22)